REMARKS/ARGUMENTS

Claims 1-6, 12-14, 22, 23, and 100-102 remain in this application. Claims 1, 3, and 101 have been amended.

In view of the amendments, applicants request reconsideration of the rejection of claims 1-6, 12-14, 22-23, and 100-102 under 35 U.S.C. Section 112, second paragraph.

With respect to claim 3, Applicants do not agree that claim 3 is indefinite for failing to particularly point out and distinctly claim the subject matter. In particular, the steps set forth in claim 3 appear to be clear and easy to understand.

Applicants respectfully traverse the rejection of claims 1-6, 12-14, 22-23, and 100-102 under Section 35 U.S.C. 112, first paragraph. The Patent Office has indicated that

> "The claims contain subject matter which was not described in the spec in such a way as to reasonably convey to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed invention. There is no support for the glass object having an internal wall (claim 1). The only mention of a wall is the wall (81) of the furnace."

Applicants respectfully disagree. Centerline holes can be seen, for example, in Figs. 5 and 5A, as well as the wall that forms the centerline hole 60.

Applicants respectfully traverse the rejection of claims 1, 3-5, and 100-102 under 35 U.S.C. § 103(a) as being unpatentable over Onishi (6,076,376) alone or in view of Glodis (6,105,396).

According to the Patent Office, "It would have been obvious to use a pressure at least equal to atmospheric pressure (in the Onishi MCVD process), to prevent atmospheric pressure from collapsing the tube. One of ordinary skill understands that there has to be a balance of pressures to prevent the tube from shrinking." Applicants respectfully disagree. In fact, prior art hole closure processes that applicants are familiar with involve using considerable vacuum to pull the centerline hole of the optical fiber preform closed. Such vacuums are employed for example, in MCVD processes.

There is no teaching in Onishi of using any type of hole closure technique at all prior to drawing the fiber illustrated in Fig. 12, nor is there any suggestion of a hole closure technique that will result in symmetric hole closure. Instead, Onishi is clearly directed to spinning the fiber to reduce the PMD in the optical fiber, whereas applicants' invention is a method which reduces the PMD in a fiber without having to spin the fiber. While applicants' invention can be used in conjunction with spinning techniques to reduce the PMD even further, the fact that applicant is able to achieve such low PMD without having to spin the fiber, as was necessary in Onishi, evidences the surprising improvement that applicant's invention enables.

The Patent Office indicates that it would have been obvious in view of Glodis to use a pressure at least equal to atmospheric to prevent atmospheric pressure from collapsing the tube in the Onishi MCVD process. As explained above, there is no clear teaching, or even a suggestion, in Onishi that a hole closure process was utilized to manufacture the fibers referred to by the Examiner (Figure 12). Consequently, the combination of Glodis with Onishi would not result in applicant's claimed invention as defined by newly amended claim 1.

Applicants respectfully traverse the rejection of claims 1, 2, 6, 22-23, and 100-102 under 35 U.S.C. §103 as being unpatentable over Maurer (RE 28,028). According to the Patent Office, "It is deemed that the reducing is done uniformly and symmetrically to the degree that is sufficient for the Mauer purpose. Also see column 3, lines 30-32, and column 6, lines 13-15. Alternatively, it would have been obvious to do the drawing as uniformly and as symmetrically as possible because variations in the core diameter might significantly effect the transmission characteristics as Mauer teaches." Applicants respectfully disagree. There is no mention or suggestion in Mauer of a process which would cause the hole to close symmetrically, nor is there any mention or suggestion of applying a pressure of greater than or equal to 500 Torr to the hole.

With respect to claim 6, the Patent Office indicates that it would have been obvious to plug or cap the tube so as to prevent any material from getting into the tube. Applicants respectfully disagree. There is no mention or suggestion in Maurer that would lead one to plug the tube. The Patent Office indicates that column 4, lines 71-72, and

column 7, lines 34-37, provide impetus to modify the teachings of Maurer accordingly. Applicants respectfully disagree. The portion at column 4 indicates that hydrochloric acid washing is desirable, and the portion at column 7 indicates that core and cladding materials need to be of very pure material. However, there is no mention or suggestion that the hole in the Maurer preform should be plugged or closed.

With respect to claims 22 and 23, the Patent Office indicates that "it would have been obvious to maintain the circular symmetry shown in figure 3, because there is no reason to change it, and because Maurer teaches variations are undesirable." Applicants respectfully disagree. The portion of Maurer at column 3, lines 30-32 indicate that "variations in core diameter or in either index of refraction may significantly effect the transmission characteristics of a waveguide." This passage is addressed to core diameter, nor core symmetry. This does not suggest to one of skill in the art that the hole of the preform should be closed as symmetrically as possible. In other words, if one takes the same optical fiber and draws it so that the core has a different diameter than a previously drawn fiber from the exact same optical fiber preform, the transmission characteristics of the waveguide will change considerably. This is not the same as maintaining the circular symmetry of the core.

With respect to claims 100-102, the Patent Office indicates that "as per column 7, lines 14-16 there is no layer between 0.08 and 0.15 microns. It is just a solid core within that range. Claim is only directed to the invention that has a layer there and does not limit a method which lacks a layer there." Applicants respectfully do not understand this comment by the Patent Office. The Patent Office seems to be saying that claims 101-102 are not patentable because column 7, lines 14-16 are insufficient to describe what is required by claims 101-102. Consequently, applicants submit that claims 101-102 are indeed patentable over the prior art cited.

Applicants respectfully traverse the rejection of claims 1-2, 6, 100-102 under 35 U.S.C. Section 103 as being unpatentable over Berkey (US 5,152,818).

Berkey does not mention or suggest using an intermediate glass object which has a hole wherein, the center of the hole positioned along the centerline of the glass object. Instead, feature 80 which is referred to by the Examiner in Figures 9-10 and 14 of

Berkey, shows a hole which is located off of the centerline of the glass object. According to the Patent Office, it would have been obvious to have the hole close uniformly and symmetrically along the centerline access, so that the fiber will have the same cross-section at every location along its length. Applicants disagree with this statement, as applicants have discovered that the holes can close extremely non-uniformly and non-symmetrically along the centerline axis and the fiber will still achieve the same cross-sectional dimension at every location along its length. This is further evidence of the surprising results of applicant's invention, which was not mentioned or suggested in any of the references cited by the Examiner.

Again, with respect to claims 101-102, the Patent Office indicates that "per column 13, lines 56-57, there is no layer between 0.08 and 0.15 microns. It is just a solid core within that range." Applicants submit that it is not entirely clear whether this is true, and request the Examiner to explain how he is certain that there are no layers present in the example 1 from Berkey 5,152,818.

Applicants respectfully traverse the rejection of claims 1-2, 12-14, and 22-23 under 35 U.S.C. Section 103 as being unpatentable over Berkey (US 5,917,109).

Berkey does not disclose reducing the outside diameter of the glass object under conditions sufficient to cause the hole to close uniformly and symmetrically. With respect to claim 23, there is no mention or suggestion of closing the hole such that the fiber exhibits a radial symmetry of less than .025 μm. According to the Examiner, it would have been obvious to have the fibers as close to symmetrical as possible so that the fibers possess the desired profile of Figure 7 or 8 at every position. Applicants disagree with this statement, as it is very common for optical fibers to be made such that they are not as symmetric as possible, because the degree of non-symmetry does not substantially affect the properties of the optical fiber. For example, the likely cause of the high amount of PMD in the Onishi fiber prior to spinning is due to asymmetry in the fiber. One common way to mitigate the non-symmetry is to spin the fiber, as Onishi suggests, to lower the PMD of the fiber. Applicants invention is directed to a new technique for lowering the PMD resulting in the fiber from non-symmetric hole closure, i.e., closing the hole uniformly and symmetrically so that a low level of PMD can be achieved.

Based upon the above amendments, remarks, and papers of records, applicant believes the pending claims of the above-captioned application are in allowable form and patentable over the prior art of record. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Applicant believes that no extension of time is necessary to make this Reply timely. Should applicant be in error, applicant respectfully requests that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Reply timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

Please direct any questions or comments to Robert L. Carlson at 607-974-3502.

Respectfully submitted,

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